

## EXECUTIVE SUMMARY

In September of 2011 the Bellingham Department of Public Works (DPW) received a Notice of Noncompliance (NON) from the Massachusetts Department of Environmental Protection (MassDEP) for violations related to Microbiologicals/Bacteria and the Groundwater Rule (GWR). Because of this, the MassDEP required the town to install permanent disinfection at all of its sources, provide GWR compliant treatment at Well #12, submit a corrective action plan, and some other additional items. Wright-Pierce was subsequently hired to assist the town with these items as well as to comprehensively evaluate the town's treatment needs as a result of the secondary impacts (dirty water complaints) caused by the required disinfection.

Accordingly, the ultimate goal and objective for the study was to identify the most effective and economical solution available for implementation that will assure the town a regulatory compliant drinking water supply in sufficient quantity and quality to serve its immediate and long term needs. This report is a culmination of all the investigations performed over the past several months for this important task and is summarized below.

### *Water Supply Evaluation and Projections*

The town's existing water supply usage was evaluated and utilized for water use projections out to year 2030. Using a conservative population projection along with current unaccounted for water (UAW) trends, it was determined that the town would soon exceed its permitted withdrawal and needed to bring its UAW down to the 10% standard requirement. Based on the assumed attainment of 10% UAW, it was projected that the town would have an average-day demand of 1.37 MGD and a maximum-day demand of 2.43 MGD (and be within its permitted withdrawal limits). Based on standard water works practice, it was determined that the existing sources of supply were adequate to meet these demands based on current conditions. These average and maximum day demands were then used to assess other possible supply alternatives and treatment needs.

### *Supply Alternatives*

Potential supply alternatives, including interconnections with neighboring communities, surface water supplies, new groundwater sources, and optimization of existing groundwater sources were reviewed. Other than a potential interconnection with the City of Woonsocket, RI no other supply alternatives were determined to be adequate for Bellingham's needs. However, due to a variety of factors such as high relative cost, political uncertainty, loss of local water supply control, etc. the interconnection was not recommended.

### *Regulatory Review and Treatment Needs*

A regulatory review and treatment needs evaluation for the town's sources was performed to identify the best option available for the MassDEP mandated disinfection as well as the elimination of the related dirty water impacts (caused by the disinfection process).

All commonly practiced means of disinfection were evaluated and the continued use of chlorine was identified as the best option and recommended.

Available treatment systems that remove manganese (and iron) were also evaluated. The high rate pressure filtration option was ultimately selected as the most economical option. The use of GreensandPlus media was also specifically recommended for this option as it has successfully been used at the town's existing Hartford Avenue WTP and would likely provide the most cost competitive option to the town when implemented. As the recommended process also requires the use of chlorine as an oxidant, its continued use as a disinfectant was another advantage for the recommended process.

### *Alternatives Analysis and Screening*

Based on the recommended use of chlorine for the mandated disinfection and high rate pressure filtration for manganese (and iron) removal, four treatment options were presented for evaluation. To correspond with the logical layout of the town and its corresponding water withdrawal permits, two options were presented for the north and two options were presented for the south.

Probable project costs and probable annual operating costs were estimated for all four options. The probable project costs for the two North Alternatives ranged from approximately \$5.35M to \$5.37M. The corresponding probable annual operating costs (including estimated debt service payments) ranged from approximately \$467K to \$469K.

The probable project costs for the two South Alternatives ranged from approximately \$8.11M to \$10.04M. The corresponding probable annual operating costs (including estimated debt service payments) ranged from approximately \$785K to \$788K.

Based on the estimated total annual operating costs (capital and recurring O&M), North Alternative No. 2 (modifications to the existing Hartford Avenue treatment facility in the north region) along with South Alternative No. 2 (the construction of a single combined treatment facility in the south region) were estimated to be the least costly option to supply the water quantity and quality needed for the Town. The total annual cost for these two improvements was estimated to be approximately \$1.251M.

### *Recommendations*

It was recommended that the town proceed with the two least costly options identified (North Alternative No. 2 and South Alternative No. 2). The recommendation would provide processes the town staff are already familiar with, GWR compliance (through disinfection) for all of the town's sources, and treatment standardization using the high rate pressure filtration process (with GreensandPlus media).

Due to the magnitude of necessary raw water main installation that will be required, it was noted that other possible routes (via easements, off-road installation, cross country routes, etc.) and construction methods would be considered for potential cost savings during the design phase. In particular, the use of horizontal directional drilling (HDD) as a possible means of construction would be investigated.

### *Implementation Requirements*

The town is currently under an NON from the MassDEP and it is understood that an Administrative Consent Order (ACO) is forthcoming. In summary, the ACO will at least formalize the steps that the town must take to implement the conditions previously identified within the NON. It will also establish a set timeline/schedule for all the required steps to be completed and likely incorporate financial penalty provisions should the requirements not be met. Based on recent communications with MassDEP, the ACO was anticipated to be drafted out in early September. At this time, it is anticipated that the ACO requirements will require that the identified improvements be constructed and fully operational by April 2015.

Identified steps that will be required to meet this deadline include the design, permitting, and construction of the recommended improvements. A number of permits and approvals have been preliminarily identified that will be required from a variety of state and local authorities.

Initial rate impacts and financing alternatives have been preliminarily identified for the implementation of this project in conjunction with the town's other previously identified Capital Improvement Program (CIP). Anticipated changes to the water rates, taxes, and a combination (water rates and taxes) have been preliminarily calculated.

As the town was under an NON (and forthcoming ACO), a competitive application was submitted to the MassDEP in August for potential financing through the Drinking Water State Revolving Fund (DWSRF) program. For qualified projects, the DWSRF program provides low interest financing (currently at 2%). Preliminary notification of ranking (funding potential) can be expected between November and December of 2012.

The town also has an excellent bond rating from Standard & Poor, and as such has had recent success with financing its own projects at similar interest rates. However, the economy and conditions affecting the borrowing markets are subject to change. Therefore, the Town should consider all available options, including the DWSRF program, for the financing of the required improvements and proceed with the option that provides it with the best financial terms.